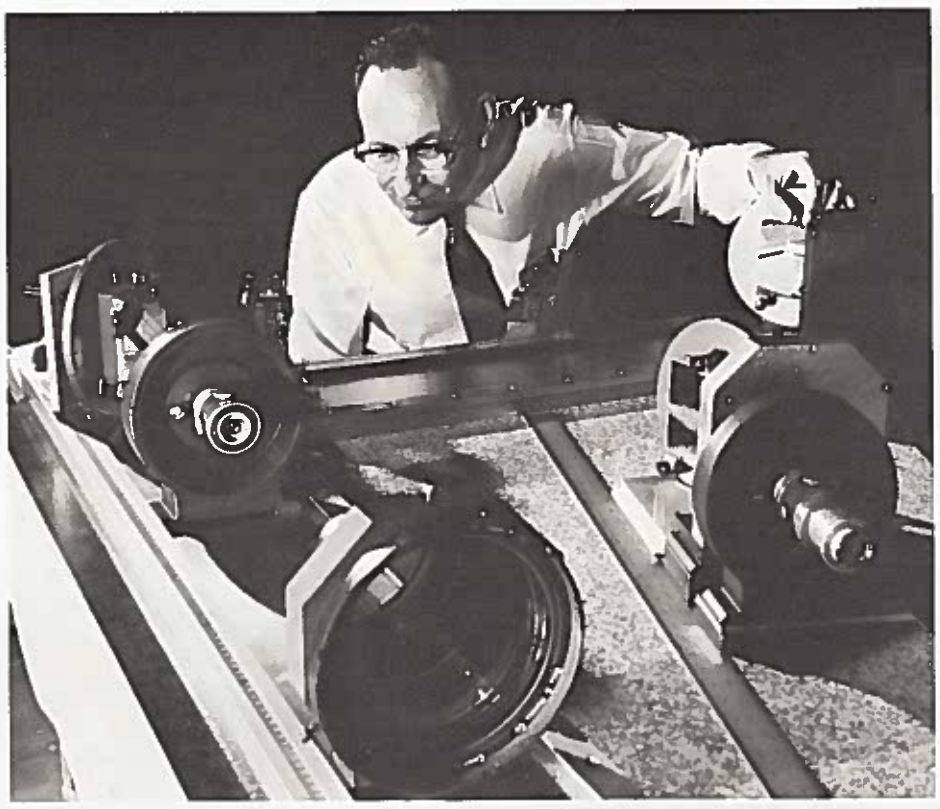
plane GRUMMAN news

Vol. 29, No. 5, Bethpage, N. Y., March 13, 1970

Research working on 'instant' system to identify enemy ground targets



On line. Research engineer Alex Grumet of the Plant 14 electronic research laboratory aligns the optics network that is a central part of his automatic target-recognition system, now under development.

A camouflaged column of enemy armored tanks pounds along on a narrow, shaded country road, and an aircraft pilot—too high to see the procession—locates the enemy units and destroys them or brings in other planes to do the job.

Fanciful? Not really. Just research-steps away, if a man in Grumman's Electronic Systems section has his say about it.

The man is Alex Grumet, a Research engineer. He's teamed up with Abe Reich of the Advanced Development Department to take on a task that first occurred to Alex during the Cuban missile crisis: To create an automatic target-recognition system for reconnaissance aircraft. And the men have come up with a prototype of an electro-optical device that could provide them with the answers they're after.

Alex conceived of the system and the prototype is the result of three years of experimentation and tests in the Optical Signal Processing Lab, a joint facility of the Research and Advanced Development Departments in Plant 14. Their device is based on a concept that uses a laser and two specially-designed optic plates in order to recognize targets on photo-reconnaissance films.

Instant recognition

"As we see this device," Alex says, "it will eventually be an integral part of reconnaissance aircraft doing real-time scanning; the film will be replaced by a transducer (conversion device) that will view the ground and tell the pilot, immediately, the number and location of enemy targets within an area."

That capability is far beyond present infrared (IR) and radar systems, such as those in use on the Mohawk. The big advantage of the new system would be its ability to alert the pilot automatically, in real-time, to the presence of real targets.

That's a big difference: Today, an aircraft can (for all practical purposes) merely photograph an area, return to base, and sit there while the film is being processed. Photo interpreters scan the photos and, on spotting a target, call in tactical forces. But by that time—unless targets are stationary and poorly camouflaged—the target may have moved.

With Alex and Abe's system, that sort of target-losing occurrence wouldn't happen. "The way the system works," Alex explains, "is that lots of photos—perhaps as many as 1,000—are taken of specific objects, such as a plane or a tank or an artillery piece; and they're taken from different views and angles. The film is monitored by a laser beam and that beam is divided by a multiple holographic lens to form a large number of 'identical' patterns of a scene. (Combining two beams from a single laser source provides the three-dimensional patterns.)

"All of this is stored in modified form in the system's 'memory bank,' as many as 1,000 views on just a square inch of film. Now, let's take a flight: When a piece of that reconnaissance film on any of the stored targets is fed into the system, our device will pick it out—it will automatically 'recognize' the target(s), and not only "tell" the operator that the target is present but what it is and where it is.

"This is done in seconds, whereas it might take a human photo interpreter looking at a photo map several hours just to find the target."

Alex and Abe are now working to develop an automatic film reader with a large-scale memory, which they expect to demonstrate this year. They are fabricating the memory bank that will store and process simultaneously up to 1,000 pairs of high- and low-frequency views. They've already demonstrated the system's ability to discriminate between targets of the same type, size, shape, and orientation, and to detect partially obscured and defocused targets.

A slow process

"During the Cuban missile crisis," Alex said, "U.S. photo interpreters, with recon photos spread out all over the floor in a large room, were in their stocking feet reading the photos with magnifying glasses. It was a slow process. Then, in about 1966, I read that all of South Vietnam reportedly was photographed every day by allied planes; but only half the photos were ever used because of a shortage of interpreters.

"It takes months to train a skilled photo interpreter, and fatigue limits his effectiveness. Even if there were enough interpreters," says Grumet, "the time lag between target location and tactical action would often negate positive results. It's easy to see why an automatic system of recognition is needed."

A modest Research investigation was begun in 1967 to see if an automatic detection system could be developed. The early portion of the work involved simple efforts to "recognize" objects using the special properties of a laser.

The first objective was to develop a definition of recognition that would apply to both man and machines, that is, to find out how someone or something

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Credit Union notice

Hurdman and Cranstoun, Penney & Co., Certified Public Accountants, acting in behalf of the Supervisory Committee of the Bethpage Aircraft Federal Credit Union, has recently forwarded confirmation requests as to share and loan balances to members whose book numbers range from:

1 000011 through 1 073000

Note: Your Credit Union Book Number is comprised of your permanent number (6 digits) preceded by a control number.

This is a rountine audit operation prescribed by Federal regulations for the protection of the members. If you are included in the category listed above and you **DID NOT** receive a confirmation request, please tear out this notice, write your name, permanent number, and telephone extension in the blank space below, and forward through the inter-office mail to Hurdman and Cranstoun, Penney & Co., Plant 30.

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Hawkeye chief. Commander of Carrier Airborne Early Warning Wing II, Capt. Ray Chamberlain, flew in to Bethpage a couple of weeks ago with first E-2 Hawkeye from West Coast for modification to E-2C configuration. Greeting Captain Chamberlain are Dean Cassell, E-2A/B Program manager, and Lt. Cdr. Jim Connerton, E-2 Program manager, Naval Plant Representative Office, Bethpage.

Fly A-6E, newest Intruder, 1st test hop at Calverton

Beating its schedule by almost a month, the A-6E prototype aircraft made its first flight February 27 from Calverton, demonstrating the new AN/ASQ-133 IBM 4-pi series solid state digital computer. "On a 1-hour, 32-minute flight, the computer system proved compatible with the other installed avionic equipment, and the computer proceeded through a 10-step operational readinesss test very successfully," Bill Trillo, A-6 Program director, said last week. Grumman pilot Joe Burke was at the controls and Jim Johnson occupied the bombardier/navigator's position.

Capt. Robert C. Mandeville Jr., who is A-6 Program director for the Navy and the first pilot to complete 2000 hours in A-6s, inspected the prototype aircraft the day before its first flight, commenting that if the A-6E realizes its potential for continued good performance, "the Navy has another winner."

Flight evaluation will continue until October, when the second major subsystem that makes an A-6A into an A-6E, the Norden advanced radar, will be installed. The new radar is capable of doing the detection, tracking, and terrain clearance functions simultaneously. In addition, the A-6A weapons release system is being replaced with an armament control unit having solid state logic and release power switching.

According to Ray Sears, A-6E Program manager, the new computer, armament control unit, and advanced Norden radar will impove reliability and maintainability of the A-6E, which will result in reduced maintenance costs for the customer. Delivery of production A-6E aircraft to the Navy will start in the fall of 1971.

Project pilot Joe Burke (L) and B/N Jim Johnson look over the A-6E prototype before taking off on first flight at Calverton.

Grumman teams up on Shuttle

As a March 30 deadline looms, Grumman is racing along to complete its proposal in anticipation of winning a Phase B study contract for the NASA manned Space Shuttle. This study contract would begin before July and run into 1971. After that, NASA will choose the contractors to develop the hardware. All the major aerospace companies are competing.

President Lew Evans announced early this month that Grumman Aerospace will head a team of associate contractors in the Space Shuttle effort: Eastern Airlines; General Electric Company, Aerospace Group; Northrup Corporation, Aircraft Division.

"Because of the magnitude of the Space Shuttle Program, a team of companies, rather than one single contractor, will be required," Lew Evans pointed out. "Each of our associate contractors will provide their individual management and technical expertise to the design and development of the total Space Shuttle system."

A group of aircraft and spacecraft experts headed by Vice President Larry Mead, Space Shuttle Program director, is working assiduously in Plant 25. The concept of an orbiting space station and a shuttle system for delivering men and materials to it not once, but many times, is the challenging program for NASA's next major manned venture into outer space.

More funds for future Hawkeyes

On the heels of an announcement last month that the E-2C development program had received $20 million in Department of Defense funding came word that an additional $27.2 million had been allotted for the airborne early warning aircraft. This brings Grumman's total to more than $100 million so far for the E-2C aircraft, a third-generation Hawkeye.

The development contract covers modification of two E-2A aircraft into two with an E-2C configuration. Flight testing of the new plane is scheduled to begin in 1971.

Flagstaff returning to States

Its tour in Vietnam complete, the Grumman hydrofoil gunboat Flagstaff is on the way back to the United States by LSD, due to arrive the end of March. She will go to San Diego and Long Beach for evaluation and overhaul, and to receive new armament.

Flagstaff was designed and built by Grumman for the U.S. Navy as a fast, maneuverable, stable gun platform. For six months the vessel, operating out of Da Nang, participated in coastal surveillance.

Five from Grumman will be participating in long-range NASA research program

A new long-range program originated by Senior Vice President Grant Hedrick to enhance and enrich our national aerospace research is taking shape at the NASA Langley Research Center in Hampton, Va. Five young men from Grumman are participating. One, Nick Corvelli, whose field is structural mechanics, is already at Langley, and next month four others will be there, embarking on a year of research and development in cooperation with NASA counterparts.

Hedrick, director of Technical Operations, said the goal is to develop advanced aerospace technology through a cross pollination between industry and NASA. Grumman is taking the lead, sending men who may be expected to gain more for the Company, NASA, and themselves through interchange of ideas than if they were working solely within the Technical Operations framework.

Attending from Grumman, besides Corvelli, are Al Vachris and Paul Barbero, both in the field of aerodynamics, Jerry Kohn, loads and criteria, and Bob Carri, structural analysis.

Other aerospace companies are being invited to join in this pilot effort. Grumman Research Associate Program participants have the use of Langley's comprehensive facilities and the cooperation of NASA specialists in attackng such areas as composite materials, rotor dynamics, studies in aerodynamics, and computer-aided design.

Off to Langley. Senior Vice President Grant Hedrick (C) has a word with Grumman men who will spend a year at NASA's Langley Research Center (L to R): Paul Barbero, Al Vachris, Bob Carri, and Jerry Kohn. Nick Corvelli is already working at the Research Center.

About the cover

Credit Fred Annette and Bud Parke of Presentations Services with the design and photography of this week's Plane News cover.

Research developing recognition system

(Continued from page 2)

is recognized. As Alex says, "If you have a pair of 'identical' twins, chances are you can't tell one from the other. However, if there is a feature peculiar to only one of the twins, then that twin can be identified. Our Research approach was to evaluate this feature and interpret it in terms of recognition."

This evaluation made it possible to formulate a "quantitative" definition of recognition. To illustrate, redhaired men are statistically rare. If a redhaired man was a sought target, he would be easily found (have a high recognition probability). With this in mind, the researchers assigned a meaningful measure (fraction of redhaired men in a group of men) to targets and compared them numerically—say, a blond versus a redhaired target.

They then applied the quantitative recognition measure to tactical situations. One such application was the determination of a "critical field of view" for photoreconnaissance. For example, picture a large field of Gs with only one C in it. Think of the C as a camouflaged tank in a jungle. How small must the field of Gs be made before the C can be recognized? This type of problem has existed in photo interpretation and pattern recognition for a long time. However, the new recognition measure has solved the problem: the researchers can determine a critical viewing area that makes the target readily apparent. The C is easier to see as the size of the field is reduced. Thus, there must be a smaller critical field of view for a "hard-to-find" object. But if a target stands out from the background, very large areas of the terrain can be processed by the detector at each "look"—a C in a field of Ts condition, as also shown in the illustration.

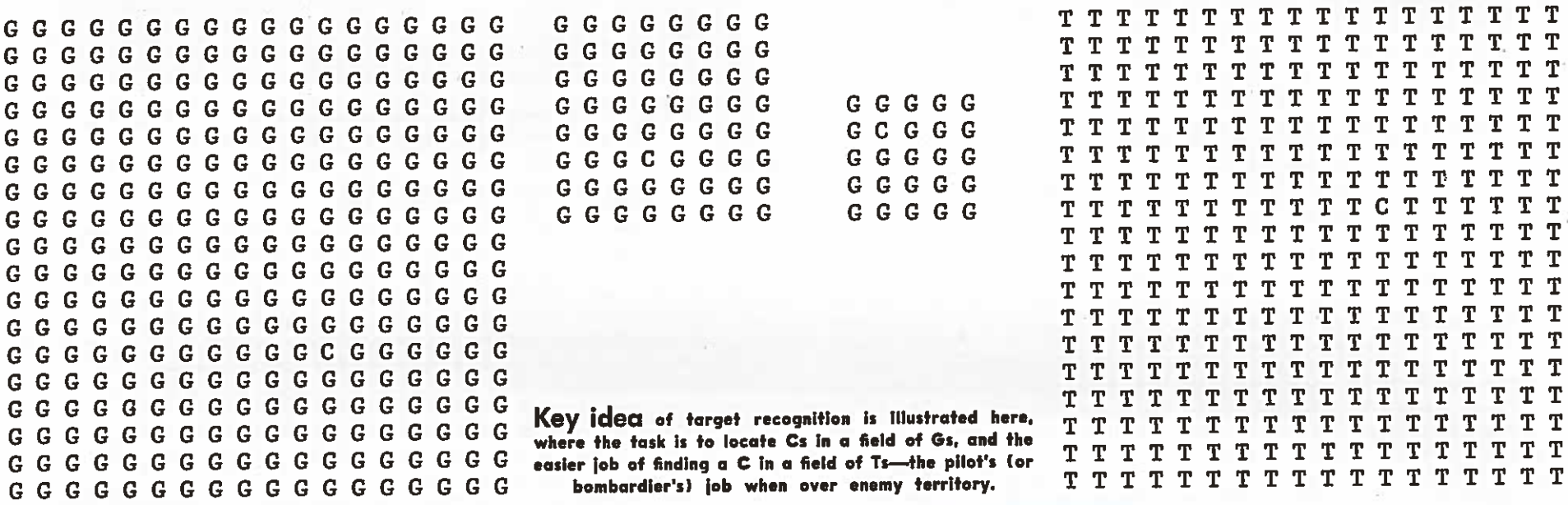
"We found that in an area no larger than the critical viewing area, the target could be readily found and identified," Alex said. "This corresponds to the C in the smaller G fields. The total area enclosed in the critical viewing area need not be viewed in detail to recognize the target's presence. Critical area viewing can speed up a search procedure. This ties in directly with what is called quantitative recognition."

The next step in the investigation was to develop equipment that would locate real targets, such as tanks or antiaircraft installations. This resulted in a prototype device that uses a laser for processing entire scenes of imagery at high speed.

What comes next? Abe says it is the development of a system that can be used in a real-world environment, a device on a plane that will automatically detect objects on the ground in real time and by-pass the use of film as a storage medium. "It will be able to 'see' partially obscured targets," says Reich, "and will provide the pilot a 'first pass strike' capability over such a target."

Although military applications with his new approach are certainly of immediate interest, there are many potential commercial spin-offs, as well. Medical scientists, for example, may be able to use the system to isolate dangerous cells (perhaps cancer) in films taken of the human body. Also, it might be used in industrial quality control for detecting a single flaw in a single item of perhaps thousands of "exact" items on a production line. Or it might be valuable to ecologists, perhaps for determining the board feet of lumber in a specific species of trees in a forest.

It's still theory now, but it may well be fact in the very near future.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Planning ahead. **Corporate Exhibits Manager Dick Bolton (R) goes over details of the annual Stockholders Meeting with John Conover of the Corporate Suggestion office. About three months of behind-the-scenes effort is put in by Bolton for the big show in May. He's a member of the Public Affairs staff and plans and coordinates the varied displays for the Stockholders Meeting.**

Bolton finds stockholder display challenging, ever-changing job

When a memo was distributed recently by Vice President Jack Rettaliata, director of Public Affairs, calling attention to the annual Stockholders Meeting (it'll be on Monday, May 18, in Hangar 6, Plant 4), bells started ringing in the office of Dick Bolton, corporate exhibits manager for Grumman.

He's the stage manager for the display of products and processes, present and future. It's an SRO show every year, and one that provides a panoramic view of the Corporation.

"There are thousands of pieces to be prepared," Bolton stated, "and we have to merge all the ideas into an overall theme. We work with many groups on this show—Research & Development, Manufacturing Technology, Product Development. . . . oh, there must be at least a score of them. In addition, we have an outside static display of aircraft, trucks and boats. We'll have all our subsidiaries represented—it's just a great big jigsaw puzzle that must fit together perfectly.

"The biggest help I can get at this point," he added, "is to have the group coordinators bring in all their proposals early. There is so much to do . . . develop the 'story line,' put the displays together, get the art work and photo blowups done . . . a million things. Everything has to be prepared well in advance so we can move in quickly with Facilities Maintenance and literally nail the show together."

Bolton said it takes nearly three months of behind-the-scenes work to get everything ready. To do the job, he confers almost daily on the progress of the show with Rettaliata and Ned Brookfield, director of special programs.

Art background

Almost a native of Freeport (his parents moved there from Ohio when he was six months old) Dick got his professional training in Advertising Art at Pratt Institute. Before coming to Grumman, he was engaged heavily in art work for publications, advertising, and public relations agencies.

He has always been an ardent water sports enthusiast . . . and a gourmet of vast proportions. At one time he won a Grumman cooking contest, but this penchant for gourmet dishes often sends him in the opposite direction on a diet binge. Right now he's boasting a loss of 20 pounds as a member of the "Weight Watchers."

Dick was a Jones Beach lifeguard during his college days, and with the famed Bruce Parker, was the first water skiing clown in the Zachs Bay shows of years ago. He was an early partner of Elliot Murphy in the Aquacade at the World's Fair amphitheatre, and, as director, wrote, produced, and even performed in the pool shows at Jones Beach in the 30s.

He also had a fling on the stage (although the two Broadway shows he was in were shirt-lived), performed in USO presentations, worked in winter stock with the Jacoby Playhouse in Cedarhurst, and even appeared in March of Time movies. "Somehow," he mused, "I always was playing either a soldier or a cop."

Dick served an apprenticeship with scenic designer Fred Fox, and was affiliated with such well-remembered hits as "The Dough Girls," "Anna Lucasta," "Junior Miss," and "The Voice of the Turtle."

Family affair

He was a swimmer for Freeport High School, and now he's a member of the Met AAU men's committee, and often serves as a timer at local meets. The feel for surf and pool has carried through his family. His five children are all crack swimmers, and his wife, Marie, has also become involved in the water activity. Dick Jr. is attending Niagara University on a swimming scholarship and daughter Beth, now 15, still holds the Met records for the 100 and 200 yard butterfly event in the 13-14 age group. Sharon, 21, Billy, 11, and Meg, 8, all compete. They have represented the Long Beach Swim Club.

In his spare time, Bolton writes, directs and produces pool shows for Nassau County and, at times, even does a solo comedy water act.

"But right now," he said, commenting on his Grumman assignments, "I'm doing what I really love. I can't think of anything I'd rather do more than this. It's a challenge . . . things are always changing. Grumman is so diversified there's always something new . . . oceanography, aircraft, urban engineering, technical advances . . . there must be new thoughts for every show."

Pointing toward launch

Time ticks by, and soon Apollo 13, bearing LM-7, will lift off from Cape Kennedy on the way to a moon landing—the third. Astronauts for the April 11 mission are Navy Capt. Jim Lovell Jr., Apollo 13 commander; Fred Haise Jr., a civilian and ex-fighter pilot, Lunar Module pilot; and Navy Lt. Cdr. Tom Mattingly, Command Module pilot. Their target: Fra Mauro, a rugged, ridged highland in the eastern part of the Ocean of Storms.

Apollo 13 has been on the launch pad at Cape Kennedy since December. At press time, launch was scheduled for 2:13 p..m Saturday, April 11, with touchdown 103 hours and 42 minutes later (9:55 p.m. EST on Wednesday, April 15). Lovell is to step onto the lunar surface at 2:02 a.m. on Thursday. Splashdown in the Pacific would then be at 3:17 p.m. Tuesday, April 21.

The usual pre-launch activity prevails at Cape Kennedy, with the hazardous hypergolic loading of fuel having begun last Monday. In the Flight Crew Training Building at the Cape, the astronauts have been in and out of LM-7 for the past two months, going through flight readiness testing, operation of the MESA (Modularized Equipment Stowage Area) equipment, and the ALSEP (Apollo Lunar Scientific Experiments Package) deployment.

Senior Vice President Joe Gavin, director of Space Programs; Vice President Ralph Tripp, LM Program director; Vice President George Skurla, Grumman manager of Operations at KSC; and mission directors from the other major Apollo contractors attended an all-day Flight Readiness Review at the Cape on March 5. Skurla reports that "everything is in hand and tracking very well. Looks good for launch."

Fesq to head Rod & Gun officers for '70

Howell Fesq of Material, Plant 30, is the new president of the Grumman Rod & Gun Club, that venerable group catering to the outdoorsmen with hunting, fishing, and shooting junkets throughout the year.

Fesq took the presiding gavel from Warren Strittmatter of the LM Program, Plant 25, following a venison dinner enjoyed by 125 people at the Holiday Manor. Strittmatter was the recipient of a plaque given by the members of the club in recognition of his efforts over the past two years when he served as president. He was named this year as 1st vice president.

Other officers elected this year include Dick Andreano of Product Support, 34A, 2nd vice president; Vincent Garzia of Product Support, 14, recording secretary; Walter Walker Jr., Flight Avionics, 5, corresponding secretary; and Arnold Saltzman, Armament Control & Auxiliary Systems, 34D, treasurer.

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

FORREST E. WEST of Facilities Maintenance, Plant 6, died February 20 at the age of 53. He had been with the Company since 1951, and his home was on South Wind Rd., Remsenburg.

EUGENE COLLINS died February 23 after 16 years service with Grumman. He was 57 years old and he worked in Facilities Maintenance. His home was at 4 Parkview Ct., Rte. 24, Riverhead.

JOHN C. SMITH of Power Plant Design, Plant 35, died February 27. He was 54 years old and had been with Grumman three years. He lived at 16 Ivy Pl., Upper Saddle River, N. J.

ARTHUR F. HUETTNER JR. died March 4 at the age of 44. He had been with the Company since 1956 and he had worked in Fuselage Major Assembly in Plant 36, Garden City. His home was at 91 Jerusalem Ave., Hicksville.

EDWARD C. SMITH of Machined Parts/Raw Material, General Purchasing, Plant 30, died March 8. He had been with the Company since 1963 and was 60 years old. He lived at 53 Fort Hill Rd., Huntington.

New orbiting observatory

Grumman is at work on a proposal for a Phase B study of a High-Energy Astronomy Observatory — a n earth-orbital satellite to survey the sky for sources of Gamma, X-ray, and cosmic rays. The request for proposal was received February 26, and the proposal is due at NASA Marshall Space Flight Center on April 6. Bendix Corporation Navigation and Control Division and Hughes Aircraft Company are associated with Grumman. Frank Canning is Program manager.

Name Oram, Paxson to F-14 Program

Emphasizing the significance of Grumman's total commitment to meeting all financial and technical objectives of the F-14 Program, Pete Oram and Bill Paxson have been appointed deputy directors of the Program, reporting to F-14 Program Director Mike Pelehach on finance and procurement matters. They will have their offices in Plant 15. Oram will retain his responsibility as director of Contracts for Grumman.

President Lew Evans, Senior Vice President Bill Zarkowsky, and John O'Brien, Administrative Vice President, will provide direct management assistance to Pelehach and will be actively involved in the F-14 Program operations.

Jim Conners, Vice President - Operations, Grumman Data Systems Corporation, announced that Alfred Goldberg has been appointed director of Material for GDS, reporting to Conners. He is located at Corporate headquarters, Ext. 2943.

About the ads . . .

Accompanying this eight-page issue of Plane News (but not inserted) is a four-page ad supplement, including a Calendar of Events. Sorry about the Slipstream columns; space limitations make it impossible to continue them at this time.

Invite girls to join in on the run on Suggestion Office bond payoff

"Where are the girls?"

Grumman's Project Sterling winners, and especially the winners whose ideas are sufficiently outstanding for Savings Bond awards, are mostly men. Yet there must be office systems in the Company that could be improved, filing procedures that need re-thinking, duplications of effort that might be eliminated if some alert secretary or typist put her mind to the problem.

The Employee Suggestion (Project Sterling) Office has bonds to give away to men **or** women who can save the Company substantial amounts of time and money.

Frank Flynn, a programmer in Test Data Programming, Plant 5, with James Clements of the same department, are high team in a recent group of Employee Suggestion winners (all men). They share a $1,000 bond award for their idea.

Flynn, and Clements, who has since left the Company but gets his share of the award, suggested the replacement of some computer equipment for use in the LM Data Reduction Station, Plant 5. The change speeded processing time and saved $1,116 a month in equipment rental cost. The computer is used for preflight and post-flight analysis of LM mission data.

Bonds totaling $425 went to David DeLosa, a leadman in Honeycomb, Plant 3, for suggesting a change in the shielding of certain areas of F-111 stabilizer details during sandblasting. Instead of masking tape, DeLosa recommended using shields of fiberglass to protect these areas.

A $325 bond award went to Joe Stissi, power brake operator in Sub-Assembly, Plant 1, for a special power brake extension so that four sides of a detail part can be folded up in one operation.

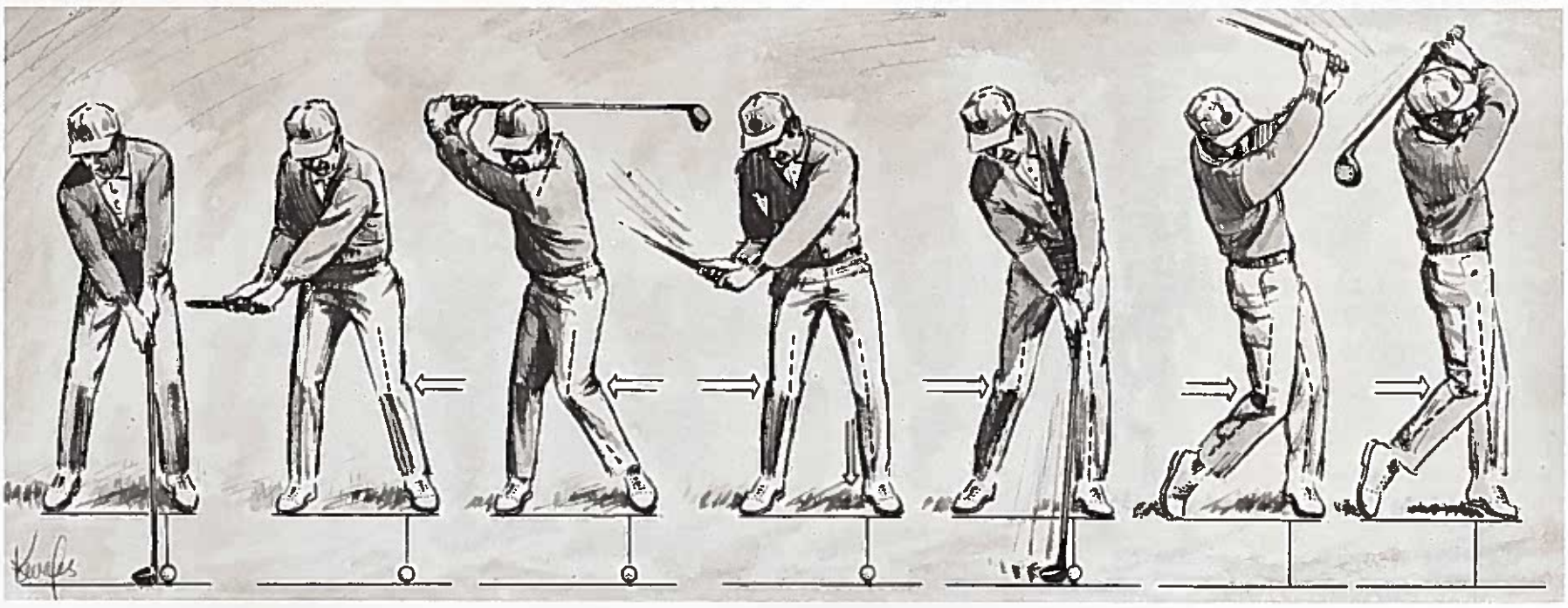
Other winners were:

$250: Matthew Heaphy, Tool Fabrication - Jigs & Fixtures, Plant 36, and John Kozsdiy, Advanced Programs - Support Mfg. Plans, Plant 29; James Holbritter and Gustave Isaksson, Press, Plant 2; Armando Macias, Quality Control Engineering, Plant 83, KSC.

$200: Richard Jordan, Operations Support, Plant 83, KSC.

$150: Thomas Underhill and Henry Gerkens, Steel Parts Assembly, Plant 2; John Cook, Tool Fabrication - Tool & Die, Plant 2.

Golf guides



Good foot action can lower scores

Good foot action is a very important element of your golf game; it helps you keep your head steady, and enables you to maintain your balance during the swing. The backswing should be initiated with a forward press—a slight forward movement with the hips and right knee—which puts the body in motion smoothly. The recoil from the forward press allows you to start the club head back in one piece (as a natural extension from the left shoulder, through the hands to the club head), low along the ground, to assure a full arc during the swing. During the backswing the wrists should start to break as the hands pass the waist line. The left knee and ankle should start to roll in toward the right knee, allowing you to shift your weight to the right foot.

At the top of the swing, the shoulders should have made a full turn, the back should be facing the hole, wrists should be fully cocked, and the club head should be horizontal to the ground. The left knee and ankle should have completed their roll toward the right knee, with the left heel slightly off the ground.

The downswing is controlled by the left side and is initiated by returning the left heel to the ground and the left knee to the straight (or starting) position. This action begins the transfer of weight from the right to the left foot. The right knee and ankle move toward the left knee, the left hip turns out of the way, bringing the arms and hands into the hitting area, ready to uncock the wrists and hit through the ball with full club head speed.

After impact, the head is still down and steady. As the right knee and ankle break in fully toward the left knee, completing the transferral of weight, the arms become fully extended, the right shoulder turns the head toward the line of flight, and the hands continue to carry the club head to a high finish. Remember, good foot work can help give you good balance and a smooth swing—and more accurate shots.

Wow! 265!

Eileen Toomey

Was it back in father's day when women were called the "weaker sex"? Well, fellas, times have sure changed and it takes a girl like Eileen Toomey of Accounting, Plant 30, to press home the point.

Eileen made a few strong men blanch in the Syosset Mixed bowling league when she nonchalantly tossed a 265 game. That record-wrecker started a 626 series—both being season highs for girls in Grumman bowling circles.

There have been only two higher games rolled by Grumman girls: a 273 rolled by Carol Reidlinger some seven years ago, and, more recently, a 266 by Marie Wood, also at Syosset, the same lanes where Bob Ruotolo rolled his epic 300 some weeks ago. Marie Wood, incidentally, is a teammate of Eileen's, along with Jim Coyne and Harold Toomey. Jim had a 276 in the league and that places three members of the same club on the Syosset honor roll.

Eileen's 265 even surpasses the men's record in the Syosset Mixed, which is 258 held by Bill Diercks. Ah, men!

Hartnack credited with 724

Cliff Hartnack, who rolled that 905 series for four games in the Masters loop reported in the last edition, is receiving special recognition from the LIBA. The pin association is accepting his first three lines as an official series of 724. Cliff started that humdinger of a night with his first three shots of 255, 235, and 234, before slipping to 181 in the fourth. Last week he came back with four games in the 200 bracket, totaling 844. He has averaged 216 in his last 12 Masters games.

Nesbitt clicks for 674

How about the luck of John Nesbitt in the F-111? He shot a smashing 674, but it won't go down as a league record, because he won't have enough games to qualify. On top of that, Nesbitt had a 268 en-route.

Keglers win Jamboree, trail in Men's tourney

Grumman found a bright place in the sun at the annual Sperry Jamboree, but quickly rolled into the shadows last Saturday in the 29th annual Men's Industrial bowling classic, which opened at Mid Isle Lanes on the night of the eclipse.

Grumman won the Jamboree crown easily, running up an 840-pin lead over the second-place Nassau County Civil Employees Association. The four Grumman teams—two men and two women's combinations—racked up 1 ,761 sticks. Play was featured by a 1,004 game by the women's A squad of Norma Frey, Sandy Ritz, Chin Thompson, Lynn Sowers, and Bertha Siegl.

Sandra Ritz shot 592 and Bertha Siegl 563, while Ben Plawski of the Men's A squad had high string of 640. Ed Hilbert shot 638 for the B squad and Chin Thompson won a trophy for the women's high game of 215. Eight companies were represented in the Jamboree.

Grumman's fortunes dipped sharply in the Men's Industrial, and the combination of Johnny Alston, Vin Crevoiserat, Plawski, Ken Gutekunst, and Jack Nielsen, shot only 2804 to rate fifth place after the opening round of the 12-game tourney. Kollsman shot into a 40-pin lead with 2900, followed by REF, 2860; Newsday, 2816, and LILCO, 2815.

Plawski paced Grumman with 606. REF unloaded a sparkling, 1,010 game, while individual stars were John Doht of Doubleday with 257 and Republic's Bob Ward and Angelo Truglio of REF who shared series honors at 622.

Five-man teams are involved in championship play, and total wood determines the winner. Remaining play is set for March 14, 21, and 28.

The standings:

Kollsman	2900	Airborne	2666
REF	2860	Pan American	2657
Newsday	2816	Stratos	2638
LILCO	2815	Sperry	2626
Grumman	2804	AMF	2623
Arma	2791	L.I. Water	2587
Republic	2768	Reeves	2569
Fairchild Camera	2669	Doubleday	2546

Collegians knot hoop standings

The Collegians have forced their way into a triple tie for first place in the Tuesday night cage circuit at Bethpage by beating the Newcomers, 101-98, in one of the season's best tussles.

Both clubs put up sparkling performances, with the outcome decided at the foul line where the Collegians netted 23 and the Newcomers only 12. The Newcomers led at the half, 47-45, but the Collegians ripped back behind the pacesetting of Bob Scully, 27, Gary Pike, 23, and Hank Manaskie, 22. Pike netted nine foul shots. Ed Krol was the Newcomers' big gun with 32, while Quarro hit for 24 and Mischo 20.

In the Wednesday circuit, the Spoilers stayed unbeaten by outclassing the Intrepids, 110-70, in the first playoff game. Ron Bartlett and Ken Sullivan both chucked in 24 points for the Spoilers, with Dick Mroz hitting for 21. Rob Scully had 23 for the Intrepids.

Intruders plan talent show

It's time to tap the dust off the spikes and oil up that old glove. Spring is just around the corner, and with it comes the tryouts for the Grumman varsity slow-pitch team.

Manager John Giordano of the Grumman Intruders has announced the start of tryouts, scheduling the first workout on Sunday, April 5, on the Plant 3 softball fields. The first ball will be tossed at 1 p.m. Tryouts will continue on Sundays and after working hours on Tuesdays and Thursdays throught May 21.

Giordano will again be assisted by the veteran Ed Schlott. They were at the helm last season when the Intruders won the Metro-Long Island Industrial slow-pitch tournament at Jones Beach, and went on to place fifth in the Nationals at McAdenville, N. C. The Intruders won the National title in 1967.

The Intruders will see action in two leagues this year, playing in the Jones Beach Industrial circuit and in the Nassau County A Division loop at Cantiague Park, Hicksville.

Additional information may be secured from Chet Baumgartner of the GAA staff, Plant 28B, on Ext. 2269 or 2133.

Like to hunt the pheasant way, or see reel '69 World Series?

For a change of cuisine, how about pheasant under glass?

The Grumman Rod & Gun Club is offering a chance of getting the "makings" at least during its annual pheasant shoot on Saturday, March 28, at Spring Farm, Sag Harbor. It's open to members and guests, but registration must be made immediately with Ted Kerpez of Support Engineering, Plant 5, Ext. 7641.

Pheasants are raised at Spring Farm, so there should be an adequate supply. Hunters will be sent off in parties of four, at a cost of $17.50 each—and each group is entitled to 12 birds. Trapshooting is also an attraction at the 400-acre layout, and hunting dogs may be rented.

The Rod & Gun Club is also staging a rifle shoot on March 30, from 7-9 p.m. at the Mitchel Field range. The club provides BSA rifles, 30-06 cal., and supplies ammunition.

Met fans can 'relive' the Series victory

There's something, too, for those wonderful N.Y. Met fans. who were hilarious with joy last fall. The Athletic Association, through the cooperation of the Met front-office, will show the film, "The World Series of 1969," next week at Calverton and Bethpage.

The "jumping with joy" boys will be able to see their beloved Mets do the impossible on Wednesday, March 18, at Calverton. The showing will be at 4:30 p.m. in the Plant 6 cafeteria for the day staff, and then at 2:30 a.m. the reel will roll for the Nite Owls.

At Bethpage, the Series will be screened on Friday, March 20, in Hangar 4, Plant 4. The day showing will be at 5 p.m., and the Owls will see the action at 9 p.m.

GAA has reduced-rate Net tickets

A basketball bargain is also being offered by the GAA, which has reduced-rate tickets available for the L.I. Nets game against the Miami Floridians on Sunday afternoon, April 12, in the Island Garden, West Hempstead. Those ducats for the ABA game are being sold at $2.50 each, half the usual price. Contact the GAA in Plant 28B on Ext. 2269 or 2133. . . . Rusty after a long layoff due to weather conditions, the varsity soccer boys are staging mid-week drills to tune up for an April assignment against the Cadets at West Point, which has become something of a traditional get-together. . . . Grumman's Gophers shot their sixth straight victory in the Industrial rifle league, outclassing Reeves, 762-545, with Al Burns nicking 193 for high honors. . . . The Rod & Gun's Trackers, again paced by Al Berka and Joe Oliveri, continued their strong bid for the championship in the Industrial League's Expert division by nipping Brookhaven Lab in a close 'un, 1054-1043. . . . Bill Daniels slid to the Owl title in the Plants 11-16 shuffleboard tournament, beating John Lorme in the showdown match. John Rothengast was the day shift king, checking John Jacobellis in the finale.

Dudonis sizzling in Classified Bowling

Bob Dudonis is having a terrific hot streak in the Classified bowling loop, rolling 628, then 643, and last week 644, with his top game at 248. . . . Johnny Alston, who has been accepted as a Professional Bowlers Assn. member, shot 638 in the Hellcat loop, but high in the previous session was Angelo Caporaso's 651, capped by 259. . . . Ruth Carr was sharp in the Hawkeye Mixed with 231. . . . Fred Wagenhauser rolled 258 to clip the Black pin record by one stick, and last week Ernie Neves unloaded a 649 series. . . . Bearcat honors went to Art Haupt's 636.

'Help Build A Better America' through U. S. Savings Bonds

Think about the preservation of our national resources . . . about the construction of hospitals and medical research centers . . . about reconstruction of blighted urban areas . . . about the critical need to check and reverse the tide of air and water pollution . . . about retirement of the Federal debt . . . about the necessity to protect salaries and savings from erosion by inflation . . . about protection of our purchasing power. . . .

Think, too, of how to Help Build A Better America.

All this—and so much more—is involved when you think about **and do something about** contributing to yourself and the country by buying U.S. Savings Bonds. What, after all, is a safer investment? And from the patriotic viewpoint, what is a more practical way to help our nation?

Whether you look at the Savings Bond drive to be kicked off today, March 13, as an opportunity to save money in an easy and systematic way, as a step toward creating an even better America, or as a patriotic duty to keep the nation sturdy and free—whatever "turns you on," so to speak—the time to pitch in is now.

Going for 100%

As all of us at Grumman have learned, if you want to win, you have to go all out. No hedging of bets. No "almost" made its. That's why Grumman this year is shooting for the top: 100 percent participation. It is possible. Cast a thought back to 1955. In that year, Grumman racked up the highest percentage of participation of any major industrial firm in the nation—99.09.

Perhaps the rationale was best put last January by James M. Roche, Chairman of the Board of General Motors Corp., who headed the 1969 Bond drive:

"No product ever had a better sales force—and I believe no salesman ever had a better product."

There's also an added incentive or two this year, too. First, Series E Bonds now pay five percent interest retroactive to June 1969 when held to maturity (five years and 10 months).

A Grumman added incentive is that the chairman of the drive for aerospace industries is Chairman of the Board Clint Towl.

Secretary of the Treasury David Kennedy is shown congratulating Clint Towl after the Grumman Board Chairman was selected earlier this year to head the aerospace industry phase of the Savings Bond drive.

PAYROLL DEDUCTION CHANGE AUTHORIZATION
FOR PURCHASE OF UNITED STATES SERIES E SAVINGS BONDS

☐ Grumman Aerospace Corporation
☐ Grumman Corporation
☐ Grumman Data Systems Corporation

PRINT ALL REQUIRED INFORMATION

Employee Name _____ Identity No. _____
First Middle Last Plant Group Permanent

1. Change deductions from $__.__ per pay day to $__.__ per pay day
2. Change Bond Value from Maturity value of ☐ $25.00 ☐ $50.00 ☐ $100.00
   To Maturity value of ☐ $25.00 ☐ $50.00 ☐ $100.00
3. Change co-owner or beneficiary from _____
   First Middle Last
   To Mr., Mrs., Miss _____
   First Middle Last
   (Use given first name for a married woman, i.e., Mrs. Mary Smith, not Mrs. John Smith.)
4. Cancel Savings Bond Deduction at close of payroll week ending _____ 19____

Date _____ Signature of Employee _____ Tele. Extension _____

Big helper. **When you receive this card with your paycheck, and fill it out, you will be contributing to both your country and your own security. Both ways, you win. Send card to Employee Services.**

The Company, of course, continues its automatic payroll allotment plan. That permits you to authorize the Company to deduct a certain specified amount each time you get your check. All you do is put in the figure; the Company does the rest. The authorization cards—and full information on the mechanics of the Bond program—will be mailed to every employee who is not now signed up in the payroll deduction plan.

"In addition to striving for 100 percent participation," says Gus D'Errico of Employee Services, "we'll be plugging to have everyone already in the plan to save even more. That means we'll be asking for higher deductions from about 80 percent of our people."

As for the Series E Bonds themselves, well, they come in only three denominations: $25, $50, and $100. You pay just 75 percent of the face value when held to maturity. Roughly, you receive $4 for every $3 you put in. (A change this year is that Freedom Shares will be removed from sale on June 30. Those purchased from May 1, 1967, through May 31, 1968, continue to earn at the original rate of 4.74 percent if held to maturity. Those purchased on or after June 1, 1968, continue to earn at the rate of 5 percent if held to maturity. Freedom Shares mature in four and one half years.)

Savings Bonds, in addition to their indestructibility (the Treasury Department replaces lost or mutilated Bonds on request at no cost), are redeemable with interest after they've been held for just two months. There's also an optional 10-year extension privilege, and Bonds are exempt from state and local taxes, and the Federal tax on interest derived from a Series E Bond may be deferred until they are redeemed.

A painless way to Help Build A Better America!

For those few who still may have reservations—even though they get a guaranteed $4-for-$3 investment rate and the security of the nation itself—think of what Bonds have contributed to our national welfare:

Since 1941, when they were introduced, $175 billion worth of Savings Bonds and Freedom Shares have been sold, including interest accruals. Of this amount, more than $52 billion is still outstanding. The Bonds and Freedom Shares now account for 24 percent of the public debt held by private investors and commercial banks, in constrast with 15 percent in 1946.

A substantial stock in America!

And there is one more extra inducement: at the end of the Savings Bond drive, there will be a drawing, and 24 people holding ticket stubs will win 24 of 28 prizes offered by Grumman.

The prize list:

1. Sylvania stereo, 25" color combination—one year contract
2. RCA 25" wood console color TV—one year contract
3. RCA 25" wood console color TV—one year contract
4. Sylvania 25" console color TV—one year contract
5. GE portable color TV-18"—one year contract
6. Westinghouse duplex refrigerator, frost free
7. GE American double oven range
8. Sylvania stereo-radio-phono combination
9. GE washer and GE dryer
10. GE 14 cubic foot two door frost free refrigerator
11. GE 16 cubic foot two door frost free refrigerator
12. Sylvania stereo AM-FM combination
13. GE 16 pound automatic washer
14. GE 16 cubic foot upright freezer
15. GE undercounter dishwasher
16. Whirlpool washer - automatic 161 pounds
17. GE electric range, 30"
18. GE 12" port-a-color set
19. GE 23" black & white console TV
20. 19" portable TV with stand
21. 23" table model, TV with stand
22. GE automatic portable dishwasher
23. Hamilton gas dryer
24. GE automatic dryer
25. *Polaroid electronic flash camera No. 360
26. *Polaroid electronic flash camera No. 360
27. *Polaroid electronic flash camera No. 360
28. *Polaroid electronic flash camera No. 360

*All with camera-case-flash, recharging unit and color film.

'Paper Purge' still going strong

What's in all those file cabinets just to the left of the desk there? Do you **know**, or is every approach to them an unnerving experience?

In 3½ years of existence, the Operation Paper Purge group, based in Plant 22, reports it has saved Grumman more than $1 million ($1,094-532.62), in equipment saved for re-use, and in cost avoidance.

Upon invitation, the Paper Purge surveyors, a Corporate group, go into an office and survey the files. They look for copies of old memos that no longer need be kept, and documents that are rarely referred to but must be retained as official records, which they send to the Record Center. They houseclean your obsolete papers for you and bring you up to date. The effect is to free old file cabinets and make the documents you do have easier to find.

The Operation Paper Purge group is especially busy right now with the 34 Complex in Syosset and Plant 25. "It would be ideal," says Irene Wiebold, head of Operation Paper Purge, "if we could supply each plant with a surveyor on a permanent basis, but we do not have enough personnel. So we ask all of the groups who have asked for help to be patient, and we'll get to them as expeditiously as possible." Call her on Ext. 9350 for information on file equipment or filing systems.